

# GOLF CLUB HEAD AND A METHOD FOR MANUFACTURING THE SAME

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## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

The present invention relates to a golf club head and the method for forming the same, and more particularly to a golf club head with a large hitting face and good flexibility.

## 2. Description of Related Art

In general, one of two ways are usually used to manufacture a golf club head. One is to form the head with a cast mold process, and the other is to weld several parts together. However, because the conventional golf club head is always made of metal and the weight of the golf club head is standardized, the area of the face of the golf club head is limited. A new golfer easily misses the golf ball with a golf club having a conventional head. In addition, the shock absorbing effect of the conventional golf club head formed by combining several parts is easily reduced because of the welding process.

To overcome the shortcomings, the present invention tends to provide an improved golf club head to mitigate or obviate the aforementioned problems.

## SUMMARY OF THE INVENTION

The main objective of the invention is to provide an improved golf club head having a face with a large area. The golf club head has a metal base, face and tubular neck and a carbon fiber cover. The face extends up vertically from

1 one edge of the base. The tubular neck is integrally connected to the base and the  
2 face. The cover is securely attached to the base and the face. Because the  
3 carbon-fiber material is lighter than the metal, the area of the face is enlarged. In  
4 addition, a better shock absorbing effect is achieved due to the carbon-fiber  
5 cover.

6 Other objects, advantages and novel features of the invention will  
7 become more apparent from the following detailed description when taken in  
8 conjunction with the accompanying drawings.

#### 9 BRIEF DESCRIPTION OF THE DRAWINGS

10 Fig. 1 is an exploded perspective view of a golf club head in accordance  
11 with the present invention;

12 Fig. 2 is a block diagram of a method for manufacturing the golf club  
13 head in Fig. 1;

14 Fig. 3 is a side plan view in partial section of the golf club head in Fig. 1  
15 with an air bag; and

16 Fig. 4 is a side plan view in partial section of the golf club head in Fig. 1.

#### 17 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

18 With reference to Fig. 1, a golf club head in accordance with the present  
19 invention comprises a base (10), a face (11), a neck (12) and a cover (20). The  
20 base (10) is made of metal. A countersunk threaded hole (15) is defined in the  
21 base (10). A countersunk recess (16) is defined in the base (10) around the  
22 threaded hole (15). A threaded plug (18) with an enlarged head (17) is screwed  
23 into the threaded hole (15). Consequently, the threaded plug (18) is securely  
24 attached to the base (10) due to the engagement with the threaded hole (15).

1           The face (11) extends up vertically from one edge of the base (10).  
2   Grooves are defined on the outside of the face (11). The neck (12) is a tubular  
3   member and is integrally connected to the base (10) and the face (11). A lip (14)  
4   is formed around the edges of the base (10) to form a cavity (13) between the  
5   base (10), the lip (14) and the face (11).

6           The cover (20) is securely attached to the lip (14) and the face (11) to  
7   cover the cavity (13). At least one weighted plug (22) with an annular recess (23)  
8   in the outer edge is inlaid in the cover (20). A bore (21) is formed in the cover (20)  
9   to securely hold each weighted plug (22).

10          With reference to Fig. 1 and 2, the process of manufacturing the golf  
11   club head comprises the following steps:

12          a. forming the base (10) and the face (11):

13          The base (10) with the lip (14) and the face (11) are cast molded. Then,  
14   the tubular neck (12) is formed with a forging process. The countersunk threaded  
15   hole (15) and the circular recess (16) are drilled in the base (10) and the threaded  
16   hole (15) tapped.

17          b. thermal treatment:

18          The body comprising the base (10), the lip (14), the face (11) and the  
19   neck (12) is thermally treated.

20          c. grinding:

21          The body is then ground to a desired shape and size.

22          d. spraying aluminum oxide sand onto the body:

23          By spraying the aluminum oxide sand onto the inner surface of the  
24   cavity (13) of the body and the edge around the cavity (13), the surface

1 roughness of the body is increased.

2 e. attaching the cover (20) to the body:

3 The cover (20) formed with multiple carbon-fiber layers. Multiple bores  
4 (21) are defined in the cover (20). The cover (20) with bores (21) is attached to  
5 the body to cover the cavity (13).

6 f. inlaying the weighted plugs (22) into the cover (20):

7 A weighted plug (22) is put into each bore (21) in the cover (20).

8 g. inserting an air bag (30) into the body:

9 With reference to Figs. 2 and 3, an air bag (30) is inserted into the cavity  
10 (14) through the threaded hole (15) in the base (10). The body with the air bag  
11 (30) is then put into a hot-pressing machine.

12 h. inflating the air bag (30) and hot pressing:

13 The air bag (30) is inflated and expands to abut the inner surface of the  
14 cover (20) and the body, such that the outer surface of the cover (20) will press  
15 against the entire inner face of the mold in the hot-pressing machine. During the  
16 hot-pressing mold process, the cover (20) will harden and form to a shape  
17 conforming to the shape of the hot-pressing mold. The cover (20) will be  
18 securely attached to the base (10) and the face (11). Because the edge of the base  
19 (10) and the face (11) was sprayed with the aluminum oxide sand, the attachment  
20 between the cover (20) and the body is enhanced. The weighted plugs (22)  
21 received in the bores (21) will be securely held into the cover (20) when the  
22 cover (20) hardens during the hot-pressing mold process. In addition, with  
23 reference to Fig. 4, a rib (212) will be automatically formed in each bore (21)  
24 during the hot-pressing mold process to engage the annular recess (23) in each

1 weighted plug (22). The combination between each weighted plug (22) and the  
2 cover (20) is enhanced. In another embodiment, an annular rib is formed on an  
3 outer edge of each weighted plug (22), such that a recess engaging with the rib of  
4 each second block (22) will be defined in each bore (21) during the hot-pressing  
5 mold process.

6 i. attaching the threaded plug (18) to the base (10):

7 The air bag (30) is taken out of the body. The threaded plug (18) is  
8 screwed into the threaded hole (15) in the base (10) so that the head (17) is flush  
9 with the outer surface of the base (10). Consequently, the position of the center of  
10 gravity of the golf club head is adjustable based on the size and placement of the  
11 threaded plug (18) and weighted plugs (22).

12 j. fine grinding:

13 To increase the smooth of the surface of the golf club head, a fine  
14 grinding process is carried out.

15 k. coating: and

16 The outer surface of the golf club head is coated with lacquer to provide  
17 a protective coating on the head.

18 l. packing:

19 The golf club head is packed.

20 Accordingly, a golf club head with a carbon-fiber cover (20) is made.

21 Because the weight of the carbon-fiber material is lighter than the metal, the  
22 weight of the golf club head is reduced. Consequently, a face (11) with a larger  
23 area can be formed on the golf club head that is the same weight as the  
24 conventional golf club head made of metal. The face is enlarged. The likelihood

1 of completely missing the golf ball can be greatly reduced. In addition, because  
2 the elasticity of the carbon-fiber material is better than that of the metal material,  
3 the shock absorbing effect of the golf club head is improved.

4 Even though numerous characteristics and advantages of the present  
5 invention have been set forth in the foregoing description, together with details  
6 of the structure and function of the invention, the disclosure is illustrative only,  
7 and changes may be made in detail, especially in matters of shape, size, and  
8 arrangement of parts within the principles of the invention to the full extent  
9 indicated by the broad general meaning of the terms in which the appended  
10 claims are expressed.